

**National Climatic Data Center**

**DATA DOCUMENTATION**

**FOR**

**DATA SET 3273 (DSI-3273)**

**Continuous Carbon Dioxide IN SITU Measurements - Hourly Averages**

**March 19, 2003**

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1. **Abstract:** The Continuous Carbon Dioxide In situ Measurements Data File contains data from the Climate Monitoring Diagnostics Laboratory (CMDL), a part of the National Oceanic and Atmospheric Administration's Environmental Research Laboratories (NOAA/ERL). There are four global baseline observatories maintained and operated by CMDL where local pollution and anthropogenic influences are frequently non-existent. The sites are located at Barrow, Alaska (BRW-27514), Mauna Loa Observatory, Hawaii (MLO-21511), Cape Matatula, American Samoa (SMO-61707), and South Pole, Antarctica (SPO-90002) where the information in parenthesis represent the 3 letter station abbreviation and the 5 digit WBAN identification number. The data taken from these four stations go back to the mid-1970s.

Demand for data and comprehensive information concerning past and future fluctuations in atmospheric composition and climate has increased and NOAA has a leading role in meeting this demand. Therefore, CMDL takes long-term monitoring data on atmospheric trace constituents. One of these constituents is Continuous CO2 in situ measurements.

2. **Element Names and Definitions:**

RECORD-TYPE - The type of data stored in this record. Value is "HLY". Each record contains one day of hourly values.

STATION-ID - Contains the WBAN Station Number. (Assigned by NCDC.)  
Range of values: 21511 (MLO), 27514 (BRW), 61707 (SMO), 90002 (SPO).  
Eight digit station numbers are always right justified, zero filled.

ELEMENT-TYPE - The type of data element stored in this record. CO2H - (Carbon Dioxide Hourly Averages)

ELEMENT-UNITS - The units and decimal position of the data value for this record. The element units used for this data record is PM - Parts per million in hundredths.

YEAR - This is the year of the record. Range of Value is 1973 - current year processed.

MONTH - This is the month of the record. Range of value is 01-12.

SOURCE-CODE-1 - Contains a code that indicates the instrument type used in taking the data. (blank) - **Source code not used at this time.**

SOURCE-CODE-2 - Contains a code that indicates the back-up instrument type used in taking the data. (blank) - **Source code not used at this time.**

DAY - Contains the day of the record. Range of value is 01-31.

NUM-VALUES - This notates the actual number of values reported. Range of values is 001-024.

TIME-OF-VALUE - Range 0100-2400 contains the hour of the hourly element value. Times are expressed in Greenwich Mean Time (GMT).

SIGN-OF-METEOROLOGICAL-VALUE - This is the 'SIGN' of the meteorological

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data value (Tape Field 013). A blank represents a positive value or a minus sign represents a negative value. The sign is always blank.

DATA-VALUE - Actual data value. This field is a five digit integer. Units and decimal position are indicated in the ELEMENT-UNITS field described in Tape Field 004. Missing values which contain a flag other than blank (see Flag-1 and Flag-2 fields) are assigned 99999. Missing Values which contain blank flag fields (ie., no observation made) are not included in the variable length record structure.

FLAG-1 - The data Flag (part 1). See Table A for an explanation.

FLAG-2 - The data Flag (part 2). See Table A for an explanation.

**TABLE A: EXPLANATION OF CARBON DIOXIDE FLAGS 1 AND 2**

These are flag used to distinguish between background concentrations and concentrations contaminated due to local sources and sinks of CO<sub>2</sub>, as well as to indicate other peculiarities about the value. Flag-1 and Flag-2 are treated as one flag field consisting of two characters.

NUMBER OF OCCURRENCES (BY STATION): (data through 1990)

FLAG	DESCRIPTION	BRW	MLO	SMO	SPO
	(blank) no flag assigned	98713	69666	71508	115462
C	Weekly Calibration (not data)	5603	5449	4766	4319
I	Instrmt Malfunction (no data)	8329	5519	7448	6090
V	Large hourly Co2 Variability	11897	18636	12292	337
D	Hour to Hour Diff. >0.25 ppm	8501	16027	4714	480
A	Based upon spline curve	11258	8604	609	11
N		0	0	0	11
U		500	38	254	71
T		821	43	1840	33
LC		81	70	4	524
NC	No analog strip chart	3008	1169	943	1267
DN	Rejected, diurnal	0	16972	0	0
R		25	246	16	0
E		0	689	0	0
WD		0	0	13855	0
WS		0	660	3478	0
PF		403	998	828	269
TF		50	16	653	0
SI		417	299	265	61
GA		9	0	53	0
RV		0	19	39	0
WA		0	0	0	0
VA		0	0	875	0
VV		0	70	553	0
PO		36	198	90	40
AC		3	0	6124	22
AL		2256	12	3	2423
VW		844	0	261	0
VO		0	138	0	0
MA		0	29	1	71
SW		0	116	0	0
LD		4	166	11	1
H		0	65	0	0

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HV	0	60	0	0
SV	0	45	0	0
ST	12	0	0	0
F	13	1	0	1
S	1	3	0	0
Y	0	1	0	0
L	0	1	0	0
W	0	0	2	0
ES	0	1	0	0
SC	0	0	3	0

TOTAL: 152870 146136 131496 131496

3. **Start Date:** Data goes back to the Mid-1970's, varies by station.

4. **Stop Date:** Ongoing.

5. **Coverage:** There are four global baseline observatories maintained and operated by the Climate Monitoring Diagnostics laboratory (CMDL). The observatories are located at Barrow, Alaska, Mauna Loa Observatory, Hawaii, Cape Matatula, American Samoa, and South Pole, Antarctica.

6. **How to Order Data:**

Ask NCDC's Climate Services about the cost of obtaining this data set.  
Phone: 828-271-4800  
FAX: 828-271-4876  
E-mail: [NCDC.Orders@noaa.gov](mailto:NCDC.Orders@noaa.gov)

7. **Archiving Data Center:**

National Climatic Data Center  
Federal Building  
151 Patton Avenue  
Asheville, NC 28801-5001  
Phone: (828) 271-4800.

8. **Technical Contact:**

**Climate Monitoring & Diagnostics Laboratory**  
**Carbon Cycle Greenhouse Gases**  
325 Broadway R/CMDL1  
Boulder, CO 80305

National Climatic Data Center  
Federal Building  
151 Patton Avenue  
Asheville, NC 28801-5001

9. **Known Uncorrected Problems:** No information provided with original documentation.

10. **Quality Statement:** The actual data in this file is continuous carbon dioxide in situ measurements. The primary data set consists of one-hour average values. Calibrations and quality assurances are performed on the data.

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Every effort is made to produce the most accurate and precise measurements possible. However, due to the measurement methods used, CMDL reserves the right to make corrections to the data, based on re-calibration of reference gases and instrumentation. This is especially true for the following time periods, when relatively large corrections are likely:

Barrow	January 1, 1989 to present
Mauna Loa	January 1, 1991 to present
Samoa	December 1, 1988 to present
South Pole	January 1, 1991 to present

A selection process of each data value is done to distinguish "background" concentrations, that is, the values that CMDL believes are not contaminated by local sources or sinks of CO<sub>2</sub>. There are a number of possible codes which are attached as flags for each hourly value which distinguish between background concentrations and concentrations contaminated due to local sources and sinks of CO<sub>2</sub>.

11. **Essential Companion Datasets**: No information provided with original documentation.

12. **References**: No information provided with original documentation.

<http://www.cmdl.noaa.gov/index.html>